

What is claimed is:

1. A liquid feed system comprising:

at least one liquid dispenser;

5 a collapsible fluid container for holding a liquid, the collapsible fluid container located at an elevation lower than the elevation of the at least one liquid dispenser; and at least one line coupling, in fluid communication, the collapsible fluid container to the at least one liquid dispenser.

2. The liquid feed system of claim 1, wherein the at least one liquid dispenser further comprises:

10 a positive displacement pump, the positive displacement pump having;

a casing with opposing ends;

an inlet tube at one end of the casing for coupling, in fluid communication, the casing to the at least one line;

15 a cylinder connected to the casing, the cylinder including a piston cavity, the piston cavity defined at one end by a cavity wall, the cavity wall having an opening;

a piston slideably positioned in the piston cavity, the piston having a passage and a slot;

a spring positioned within the piston cavity between the piston and the opening in the cavity wall;

20 a first one-way valve located within the piston cavity between the spring and the cavity wall, the first one-way valve positioned to block liquid flow from the piston cavity through the opening in the cavity wall, while permitting liquid flow from the opening into the piston cavity;

25 a second one-way valve located within the piston cavity between the piston and the spring, the second one-way valve positioned to block liquid flow from the passage of the piston into the piston cavity, while permitting liquid flow from the piston cavity into the passage; and

a pin fixed in the cylinder and riding in the slot of the piston, the pin permitting sliding of the piston in the piston cavity while limiting the travel of the piston and preventing piston rotation.

3. The liquid feed system of claim 1, further comprising:

5 a nozzle connected to the collapsible fluid container; and
a mating cap having opposing ends, one end of the mating cap for engaging the nozzle, and the other end of the mating cap coupled, in fluid communication, to the at least one line.

4. A liquid feed system comprising:

10 at least one liquid dispenser;
a first collapsible container for holding a liquid, the first collapsible container located at an elevation lower than the elevation of the at least one liquid dispenser;
a second collapsible container for holding additional liquid, the second collapsible container located at an elevation lower than the elevation of the first collapsible container;
15 and
at least one connecting line coupling, in fluid communication, the first collapsible container to the second collapsible container and the first and second collapsible containers to the at least one liquid dispenser.

5. The liquid feed system of claim 4, further comprising:

20 a first outlet nozzle connected to the first collapsible container; and
a first outlet lever control valve for controlling the flow of liquid from the first collapsible container through the first outlet nozzle.

6. The liquid feed system of claim 5, further comprising an adapter, the adapter including;

25 a housing having;

a cylindrical portion having opposing ends, one end of the cylindrical portion for receiving the first outlet nozzle; and

a barbed outlet at the other end of the cylindrical portion configured for coupling to the connecting line, the barbed outlet having a bore;

5 a piston having;

a shaft having opposing ends and at least one rib, the at least one rib including a radially extending shoulder portion;

a plug mounted at one end of the shaft, the plug having a peripheral groove; and

10 an O-ring received in the peripheral groove, the O-ring and plug in combination sealing the bore of the barbed outlet when the adaptor is not connected to the first outlet nozzle; and

a spring positioned within the housing between the barbed outlet and the radially extending shoulder portion of the shaft.

15 7. The liquid feed system of claim 6, further comprising a second outlet nozzle connected to the second collapsible container.

20 8. The liquid feed system of claim 7, wherein the adapter is mounted at one end to the second outlet nozzle of the second collapsible container and connected at the other end to the connecting line, the cylindrical portion of the housing configured at one end for receiving the second outlet nozzle, and the O-ring and plug in combination sealing the bore of the barbed outlet when the adapter is not connected to the second outlet nozzle.

9. A liquid feed system comprising:

at least one liquid dispenser;

25 a first collapsible container for holding a liquid, the first collapsible container located at an elevation lower than the elevation of the at least one liquid dispenser;

a second collapsible container for holding additional liquid, the second collapsible container located at an elevation lower than the elevation of the first collapsible container, and the second collapsible container including a wall and an interior surface;

a first connecting line coupling, in fluid communication, the first collapsible
5 container to the second collapsible container; and

a second connecting line coupling, in fluid communication, the second collapsible container to the at least one liquid dispenser.

10 10. The liquid feed system of claim 9, wherein the first connecting line includes a connecting link adaptor having a first portion and a second portion matable to the first portion, wherein the first portion is coupled, in fluid communication, to the first collapsible container, and the second portion is coupled, in fluid communication, to the second collapsible container.

15 11. The liquid feed system of claim 10, wherein the first portion includes a valve actuated by connecting and disconnecting the first portion to the second portion, so that the liquid flows from the first collapsible container to the second collapsible container when the first portion is connected to the second portion, and liquid is prevented from flowing from the first collapsible container, via the first portion, when the first portion is disconnected from the second portion.

20 12. The liquid feed system of claim 10, wherein the second portion includes a valve that is actuated by connecting and disconnecting the first portion to the second portion, whereby liquid is permitted to flow from the first collapsible container to the second collapsible container when the first portion is connected to the second portion, and liquid is prevented from flowing out of the second collapsible container, via the second portion, when the first portion is disconnected from the second portion.

25 13. The liquid feed system of claim 9, further comprising:
an inlet nozzle connected to the wall of the second collapsible container;

an outlet nozzle connected to the wall of the second collapsible container;

an inlet mating cap having opposing ends, one end of the inlet mating cap for engaging the inlet nozzle, and the other end of the inlet mating cap coupled, in fluid communication, to the first connecting line; and

5 an outlet mating cap having opposing ends, one end of the outlet mating cap for engaging the outlet nozzle, and the other end of the outlet mating cap coupled, in fluid communication, to the second connecting line.

14. The liquid feed system of claim 13, further comprising a conduit strip having opposing ends, a plurality of conduit ridges, and a plurality of conduit channels, the conduit strip
10 connected to the interior surface of the second collapsible container, one end of the conduit strip overlapping the inlet nozzle and the other end of the conduit strip adjacent to the outlet nozzle when the second collapsible container is collapsed.

15. The liquid feed system of claim 14, wherein the second connecting line includes a first tube and a second tube, the first tube coupling, in fluid communication, the outlet mating
15 cap to an inlet of a first dispenser adapter connected to the at least one liquid dispenser, and the second tube coupling, in fluid communication, an outlet on the first dispenser adapter to an inlet of a second dispenser adapter connected to another liquid dispenser.

16. The liquid feed system of claim 15, further comprising:

a first container nozzle coupled, in fluid communication, to the first collapsible container;

20 and

a first container mating cap having opposing ends, one end of the first container mating cap for engaging the first container nozzle, and the other end of the first container mating cap coupled, in fluid communication, to the first connecting line.

17. The liquid feed system of claim 9, further comprising:

a port in the second collapsible container;
a lid connected to the port, the connection between the lid and port providing an airtight seal;

an inlet connection tube connected to the port, the inlet connection tube coupled, in fluid
5 communication, to the first connecting line;

an outlet connection tube connected to the port, the outlet connection tube having opposing ends;

a J-shaped tube having opposing ends; and

a withdrawal tube positioned within the second collapsible container when the lid is
10 connected to the port, the withdrawal tube coupled, in fluid communication, to one end of the J-shaped tube, the other end of the J-shaped tube coupled, in fluid communication, to one end of the outlet connection tube, the other end of the outlet connection tube coupled, in fluid communication to the second connecting line.

18. The liquid feed system of claim 17, wherein the second connecting line includes a
15 first tube and a second tube, the first tube coupling, in fluid communication, the outlet connection tube to an inlet of a first dispenser adapter connected to the at least one liquid dispenser, and the second tube coupling, in fluid communication, an outlet on the first dispenser adapter to an inlet of a second dispenser adapter connected to another liquid dispenser.

20 19. The liquid feed system of claim 18, further comprising:

a first container nozzle coupled, in fluid communication, to the first collapsible container; and

a first container mating cap having opposing ends, one end of the first container mating cap for engaging the first container nozzle, and the other end of the first container
25 mating cap coupled, in fluid communication, to the first connecting line.